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RE: Responses to the proposed revision to the Model Water Efficient Landscape Ordinance (MWELO)

The conservation and preservation of water is of the upmost importance to Brickman / ValleyCrest – the nation's largest landscape design, installation and maintenance firm. We stand with Governor Brown, his administration and the California Department of Water Resources in preserving California's water resources for the importance of our State's long term growth. Implementation of proper and practical solutions that yield water savings during the design, installation, and long term management stages of a landscape are critical to preserving water. The following submission is our response to the AB 1881 proposed revisions.

Section 491. Definitions. (b).

Recommendation *- The definition of a controller that schedules irrigation events using either evapotranspiration or soil moisture data should be changed from "automatic irrigation controller" to "Self-adjusting irrigation controller" or "Auto adjusting irrigation controller" or "Smart controller" to minimize the risk of miscommunication.*

Discussion - The definition of an "**automatic irrigation controller**" should provide a distinguishable difference between a controller that operates on a conventional, user programmed, fixed - set schedule, and the term used to define a controller that schedules irrigation using evapotranspiration or soil moisture. The green industry currently refers to an "automatic irrigation controller" as a conventional irrigation controller that operates on a user programmed, fixed - set schedule. The industry currently commonly refers to a controller that uses evapotranspiration data or soil moisture data as a "smart controller".

Section 491. Definitions. (f).

Recommendation - It is recommended that the "**certified landscape irrigation auditor**" be certified only by the Irrigation Association.

Discussion - The Irrigation Association offers training on the latest and most efficient irrigation technology and requires stringent annual continuing education to maintain certification. Accredited academic institutions and other professional trade organization certification programs do not offer and require the degree of education on the latest and most efficient irrigation management practices and technology nor do they require the same amount of hours of continuing irrigation education as required by the Irrigation Association in order to maintain certification as a certified landscape irrigation auditor.

Section 491. Definitions. (q).

Recommendation - In order to provide greater clarity and eliminate the possibility of confusion by individual interpretation, it is proposed that the terms **"residential" and "non-residential"** used in the ETAF definition be defined themselves separately.

Discussion - Confusion may arise when a water manager or auditor encounters large homeowners association's or housing developments where all of the front yards of homes and common areas are irrigated by one single, large water source that also irrigates a common area such as a clubhouse. Under the current definition, it is unclear if two different ETAF's are to be used when developing a budget for this water source.

Section 491. Definitions. (q).

Recommendation - For the sake of consistency in state regulations and in order to eliminate confusion in the adoption and implementation of new regulations, it is recommended that "**residential" and "non-residential**" landscapes be held to the same standards and expectations and should have equal **ETAF's**.

Section 491. Definitions. (q).

Recommendation - It is suggested that the current ETAF be reduced from 0.7 to 0.53 and not 0.4. The 0.53 ETAF is derived by dividing a combined plant mix ETAF of 0.425 by an irrigation efficiency of 0.8075, which results in an ETAF of 0.53.

Discussion -The proposed ETAF of 0.4 is based on an irrigation efficiency of 0.92, which is unobtainable.

Distribution uniformity is one component of irrigation efficiency and the irrigation efficiency can never exceed the distribution uniformity of a system. (Sources: Irrigation Performance Measures: Efficiency and Uniformity" by Burt et al, published by the ASCE, Journal of Irrigation and Drainage vol 123:6, November/December, 1997 and "The

Landscape Water Budget Calculation: A Misunderstood and Misused Tool A White Paper by Tim Wilson").

Field audits yielding low quarter, distribution uniformities of 0.92 are unheard of by Irrigation Association, Certified Landscape Irrigation Auditors. Even the most efficient irrigation products with the highest emission uniformities cannot produce low quarter, distribution uniformities of 0.92.

Utilizing an achievable, high, distribution uniformity of 0.85, with a management efficiency of 0.95 results in irrigation efficiency of 0.8075.

From a water managers perspective, under irrigating, low water use plantings to a water budget with an ETAF of 0.4 derived from a combined plant mix ETAF of 0.37 and an irrigation efficiency of 0.92 will result in severely under watered, unhealthy, insect and disease prone landscapes with a high mortality rate.

Section 491. Definitions. (aa).

Recommendation - It is recommended that the **"irrigation audit"** be conducted by an Irrigation Association, Certified Landscape Irrigation Auditor.

Discussion - The Irrigation Association offers training on the latest and most efficient irrigation technology and requires stringent annual continuing education to maintain certification. Accredited academic institutions and other professional trade organization certification programs do not offer education on the latest and most efficient irrigation management practices and technology and do not require the same amount of hours of continuing irrigation education as required by the Irrigation Association.

Section 491. Definitions. (aa).

Recommendation - It is also recommended that **"system tune up"** be required before the **"irrigation audit"** and not as part of the irrigation audit.

Discussion - If system tune up is part of the audit, it implies that the auditor is responsible for completing the system tune up when it should be the responsibility of the owner and should be completed prior to the audit. Recommendations for the "system tune up" could come after an "irrigation survey" but should always come before an "irrigation audit.

Section 491. Definitions. (bb).

Discussion - As previously mentioned in the comment to the proposed ETAF of 0.4, an irrigation efficiency of 0.92 is impossible to obtain.

Distribution uniformity is one component of irrigation efficiency and the irrigation efficiency can never exceed the distribution uniformity of a system.

Irrigation Efficiency = Distribution Uniformity x Management Efficiency

(Sources: "The Landscape Water Budget Calculation: A Misunderstood and Misused Tool A White Paper by Tim Wilson").

Field audits yielding low quarter, distribution uniformities of 0.92 are unheard of by Irrigation Association, Certified Landscape Irrigation Auditors. Even the most efficient irrigation products with the highest emission uniformities cannot produce low quarter, distribution uniformities of 0.92.

At best, utilizing an achievable, high, distribution uniformity of 0.85, with a management efficiency of 0.95 results in irrigation efficiency of 0.8075. **Therefore it is recommended that an Irrigation Efficiency of 0.8075 be used instead of the proposed 0.92.**

Any experienced, irrigation system designer, irrigation manufacturer and certified irrigation auditor can attest that an irrigation efficiency of 0.92 is impossible to achieve from even the best designed and best maintained system.

Section 491. Definitions. (nn).

Recommendation - an upper limit be added to the "maximum gallons per hour" definition of drip irrigation. For example, ASAE Standards 1998, refer to drip irrigation as having less than 2 gph for drip irrigation.

Discussion - The current definition of "**low volume irrigation**" refers to "low-volume emitters" but there is no definition of what constitutes an emitter to be a "low-volume emitter". In order to provide greater clarity and eliminate the possibility of confusion by individual interpretation of what "low volume irrigation" exactly is, it is proposed that an upper limit be added to the "maximum gallons per hour" definition of drip irrigation. For example, ASAE Standards 1998, refer to drip irrigation as having less than 2 gph for drip irrigation.

Section 491. Definitions. (eee).

Recommendation - In order to prevent confusion, the current definition of "**precipitation rate**" should be changed to "application rate".

Discussion - Other industry organizations such as the Irrigation Association are using "precipitation rate" to define the rate of rainfall and "application rates" is being used to

define the application rate applied by an irrigation system. Section 494. In the Model Water Efficient Ordinance refers to "Effective Precipitation" as rainfall. The utilization of the term "precipitation" when referring to two completely different items, rain and sprinkler application rate, could lead to confusion.

Additional Comment to Section 491. Definitions.

Recommendation – It is suggested that the term "**Distribution Uniformity**" be included and considered when defining and setting ETAF and Irrigation Efficiency requirements

Discussion - Distribution uniformity is referred to twice in the Model Water Efficient Landscape Ordinance, first in Section 492.7. Irrigation Design Plan. (a.1.Q), under head to head coverage and a second time in Section 492.12 (a.1). Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis. As part of the discussion of ETAF's and Irrigation Efficiencies, it appears that the term **Distribution Uniformity** is missing entirely from the definition section. The Distribution Uniformity of an irrigation system is one of the most critical measurements obtained during a water audit. If ETAF's and Irrigation Efficiencies are set as part of the Model Water Efficient Landscape Ordinance, required Distribution Uniformities should also be defined and set in accordance with the Irrigation Associations definition of what is considered to be good, fair and poor distribution uniformity.

Section 492.4 Water Efficient Landscape Worksheet

Recommendation - As stated previously, the proposed ETAF's are unobtainable. Also for the sake of consistency and setting equal standards, it is recommended that equal ETAF's be used for both "residential" and "nonresidential" sites.

Section 492.6. Landscape Design Plan. (a.1.C.1).

Recommendation -The current document recommends using the "Sunset Western Climate Zone System". When selecting plants by water use, it would make sense to also recommend that WUCOLS information and tables, which provide specific Plant Factors for different regions in California, be used.

Section 492.7. Irrigation Design Plan. (a.1.D) Sensors.

Recommendation - The current document needs to provide greater clarity into the conditions that the sensor needs to measure. It is unclear if the sensor needs to measure all three conditions of rain, freeze or wind, or just one of the the three conditions.

Discussion - Most sensors currently on the market sense rain and freeze, but the list of available sensors on the market that measure rain, freeze and wind is much smaller. It is unclear if a sensor that measures just one of the three, rain, freeze or wind is sufficient or if the sensor needs to measure all three.

Section 492.7. Irrigation Design Plan. (a.1.G) Flow Sensors.

Recommendation - it is recommended that a "Flow Sensor" be used in conjunction with an irrigation controller that has the capability of sending the user an alarm via email or text to inform someone that an abnormal flow situation has occurred and that the master valve has shut the system down.

It is also recommended that new systems be specified to have no more than 1 controller be installed per point of connection, and no more than 1 meter per controller. Currently, the only controllers that can manage flow on multiple controllers with multiple controllers are central control systems. Requiring irrigation systems to have a 1 to 1 relationship between controller and flow meter / master valve would provide designers with additional flexibility to propose lower cost control systems as opposed to high end central control systems.

In this section, it is also recommended that there be a definition or set parameters around the minimum flow monitoring capabilities of the controller. (IE: Fully equipped to Learn and Monitor Flow, Activate a Master Valve in the event of irregular flow, 2 way communication, etc.)

Discussion - On "non – residential" applications or sites where a commercial landscape contractor may only be visiting a commercial property once a week, it is recommended that a "Flow Sensor" be used in conjunction with an irrigation controller that has the capability of sending the user an alarm via email or text to inform someone that an abnormal flow situation has occurred and that the master valve has shut the system down. When a "Flow Sensor" is not used with an irrigation controller with outbound messaging capabilities, on a commercial property that is only serviced once a week, it is very common for operators to disable the flow sensing features on the controller due to a concern that the controller will engage the master valve under an abnormal flow condition and the landscape will go un-irrigated until the landscape maintenance service provider encounters the issue during their subsequent site visit.

Section 492.7. Irrigation Design Plan. (a.1.M) 1"/hr Precipitation Rate.

Recommendation – Allow the use of nozzles with precipitation rates greater than1.0" per hour.

Discussion - According to recent manufacturer testing, there are two nozzles that provide superior and unprecedented distribution uniformities. These two nozzles with very high

distribution uniformities are Rain Bird's Undercut nozzle and Rain Birds HE VAN nozzle. Both of these nozzles have precipitation rates greater than 1" per hour and under the proposed change to precipitation rates under 1" per hour, these two top performing nozzles with high distribution uniformities and high irrigation efficiencies could not be used. First hand use and testing of these nozzles has confirmed manufacturer claims of the high distribution uniformities.

Secondly, one of the challenges with precipitation rates below 1" per hour is the extremely long runtimes required to apply the amount of water required to replenish ET demands. Specifically, smart irrigation controllers that automatically calculate runtimes based upon daily ET changes, will automatically generate station runtimes that are so long, that the watering times will exceed the night time watering window restrictions.

For example, a large, 48 zone smart controller, using nozzles on every zone with a precipitation rate of 0.75" per hour, may require a 18 hour watering window to cycle through all of its zones, as opposed to the same 48 zone smart controller requiring a 9 hour watering window using nozzles with a precipitation rate of 1.5" per hour.

By allowing the use of nozzles with precipitation rates greater than 1.0" per hour, self-adjusting, smart controllers will calculate schedules using cycle and soak techniques to prevent runoff with short runtimes that will allow watering to be completed within the required water window.

Section 492.7. Irrigation Design Plan. (a.1.S) Check Valves.

Recommendation - Check valves should only be required on landscapes with elevation changes where low head drainage would occur without the use check valves. The additional cost of check valves in situations where there is no low head drainage would cost the consumer more money on a device that is not necessary.

Section 492.12. Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis Design Plan. (b.1)

Recommendation - Under the requirement of conducting a "system test with distribution uniformity" there should be a specific requirement around how many zones require a system test measuring distribution uniformity. It is unclear if it is every zone, or if it's a certain percentage of zones, or if it is a select number of zones that are representative of the entire site.

Section 492.13. Irrigation Efficiency. See previous comments regarding the definition of ETAF, Irrigation Efficiency, and Distribution Uniformity

Section 492.14. Recycled Water. (b and d.)

Recommendation - In order to provide greater clarity and eliminate the possibility of confusion by individual interpretation, it is recommended that the term "unforeseeable future" be replaced with a minimum set number of years.

Discussion - The questions comes into play when calculating MAWA and ETWU on for a site that will be irrigated with potable water but scheduled to be converted to recycled water in 10 years. In the current document, it appears that using an ETAF of 1.0 could be used for MAWA and ETWU calculations because 10 years is within the foreseeable future.

Section 495. Reporting. (b.9.)

Recommendation It is recommended that suggested enforcement measures be included in this section as opposed to asking the local agency for a description of enforcement measures. Setting minimum mandatory enforcement measures that local agencies would have to meet would result in making the Model Water Efficient Landscape Ordinance much more effective.

Respectfully submitted,

Brickman/ValleyCrest